

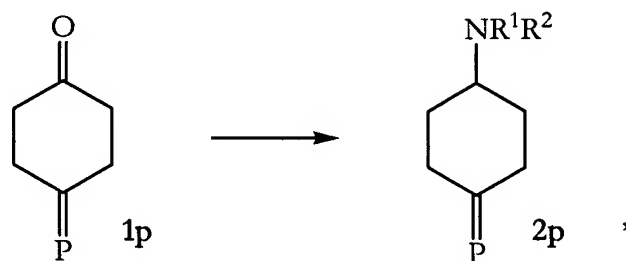
**IN THE CLAIMS**

1. (Currently amended) A process for the preparation of a 2-amino-4,5,6,7-tetrahydro-6-aminobenzothiazole **5a**:



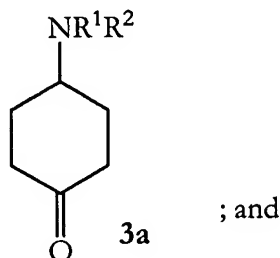
or an enantiomer or a salt thereof, comprising the steps of:

- (a) reductively aminating a protected cyclohexandione **1p** with an amine  $R^1R^2NH$  to yield a protected 4-amino-cyclohexanone **2p**:



wherein P is a protected ketone functionality, and  $R^1$  and  $R^2$  are any atom or group or, ~~together with the nitrogen to which they are attached, form a ring~~  $R^1$  and  $R^2$  are independently hydrogen or a  $C_1$ - $C_{12}$  alkyl,  $C_2$ - $C_{12}$  alkenyl,  $C_2$ - $C_{12}$  alkynyl,  $C_4$ - $C_{14}$  aryl,  $(C_4$ - $C_{14})$ aryl( $C_1$ - $C_{12}$ )alkyl,  $(C_4$ - $C_{14})$ aryl( $C_2$ - $C_{12}$ )alkenyl,  $(C_4$ - $C_{14})$ aryl( $C_2$ - $C_{12}$ )alkynyl,  $(C_1$ - $C_{12})$ alkyl( $C_4$ - $C_{14})$ aryl,  $(C_2$ - $C_{12})$ alkenyl( $C_4$ - $C_{14})$ aryl or  $(C_2$ - $C_{12})$ alkynyl( $C_4$ - $C_{14})$ aryl group, which may be unsubstituted or substituted with one or more of -F, -Cl, -Br, -I, -CF<sub>3</sub>, -CCl<sub>3</sub>, -CBr<sub>3</sub>, -Cl<sub>3</sub>, -OH, -SH, -NH<sub>2</sub>, -CN, -NO<sub>2</sub>, -COOH, -R'-O-R'', -R'-S-R'', -R'-SO-R'', -R'-SO<sub>2</sub>-R'', -R'-SO<sub>2</sub>-OR'', -R'O-SO<sub>2</sub>-R'', -R'-SO<sub>2</sub>-N(R'')<sub>2</sub>, -R'-NR''-SO<sub>2</sub>-R'', -R'O-SO<sub>2</sub>-OR'', -R'O-SO<sub>2</sub>-N(R'')<sub>2</sub>, -R'-NR''-SO<sub>2</sub>-OR'', -R'-NR''-SO<sub>2</sub>-N(R'')<sub>2</sub>, -R'-N(R'')<sub>2</sub>, -R'-N(R'')<sub>3</sub><sup>+</sup>, -R'-P(R'')<sub>2</sub>, -R'-Si(R'')<sub>3</sub>, -R'-CO-R'', -R'-CO-OR'', -R'O-CO-R'', -R'-CO-N(R'')<sub>2</sub>, -R'-NR''-CO-R'', -R'O-CO-OR'', -R'O-CO-N(R'')<sub>2</sub>, -R'-NR''-CO-OR'', -R'-NR''-CO-N(R'')<sub>2</sub>, -R'-CS-R'', -R'-CS-OR'', -R'O-CS-R'', -R'-CS-N(R'')<sub>2</sub>, -R'-NR''-CS-R'', -R'O-CS-OR'', -R'O-CS-N(R'')<sub>2</sub>, -R'-NR''-CS-OR'', -R'-NR''-CS-N(R'')<sub>2</sub> or -R'', or together with the nitrogen to which they are attached,  $R^1$  and  $R^2$  form a ring;

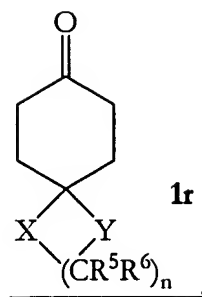
(b) deprotecting the protected 4-amino-cyclohexanone **2p** to yield an unprotected 4-amino-cyclohexanone **3a**;



(c) treating the unprotected 4-amino-cyclohexanone **3a** with iodine and a substituted-thiourea  $\text{H}_2\text{N}(\text{C}=\text{S})\text{NHR}^3$ , wherein  $\text{R}^3$  is ~~any atom or group~~ hydrogen or a  $\text{C}_1\text{-C}_{12}$  alkyl,  $\text{C}_2\text{-C}_{12}$  alkenyl,  $\text{C}_2\text{-C}_{12}$  alkynyl,  $\text{C}_4\text{-C}_{14}$  aryl,  $(\text{C}_4\text{-C}_{14})\text{aryl}(\text{C}_1\text{-C}_{12})\text{alkyl}$ ,  $(\text{C}_4\text{-C}_{14})\text{aryl}(\text{C}_2\text{-C}_{12})\text{alkenyl}$ ,  $(\text{C}_4\text{-C}_{14})\text{aryl}(\text{C}_2\text{-C}_{12})\text{alkynyl}$ ,  $(\text{C}_1\text{-C}_{12})\text{alkyl}(\text{C}_4\text{-C}_{14})\text{aryl}$ ,  $(\text{C}_2\text{-C}_{12})\text{alkenyl}(\text{C}_4\text{-C}_{14})\text{aryl}$  or  $(\text{C}_2\text{-C}_{12})\text{alkynyl}(\text{C}_4\text{-C}_{14})\text{aryl}$  group, which may be unsubstituted or substituted with one or more of -F, -Cl, -Br, -I, -CF<sub>3</sub>, -CCl<sub>3</sub>, -CBr<sub>3</sub>, -Cl<sub>3</sub>, -OH, -SH, -NH<sub>2</sub>, -CN, -NO<sub>2</sub>, -COOH, -R'-O-R'', -R'-S-R'', -R'-SO-R'', -R'-SO<sub>2</sub>-R'', -R'-SO<sub>2</sub>-OR'', -R'O-SO<sub>2</sub>-R'', -R'-SO<sub>2</sub>-N(R'')<sub>2</sub>, -R'-NR''-SO<sub>2</sub>-R'', -R'O-SO<sub>2</sub>-OR'', -R'O-SO<sub>2</sub>-N(R'')<sub>2</sub>, -R'-NR''-SO<sub>2</sub>-OR'', -R'-NR''-SO<sub>2</sub>-N(R'')<sub>2</sub>, -R'-N(R'')<sub>2</sub>, -R'-N(R'')<sub>3</sub><sup>+</sup>, -R'-P(R'')<sub>2</sub>, -R'-Si(R'')<sub>3</sub>, -R'-CO-R'', -R'-CO-OR'', -R'O-CO-R'', -R'-CO-N(R'')<sub>2</sub>, -R'-NR''-CO-R'', -R'O-CO-OR'', -R'O-CO-N(R'')<sub>2</sub>, -R'-NR''-CO-OR'', -R'-NR''-CO-N(R'')<sub>2</sub>, -R'-CS-R'', -R'-CS-OR'', -R'O-CS-R'', -R'-CS-N(R'')<sub>2</sub>, -R'-NR''-CS-R'', -R'O-CS-OR'', -R'O-CS-N(R'')<sub>2</sub>, -R'-NR''-CS-OR'', -R'-NR''-CS-N(R'')<sub>2</sub> or -R'', to yield the 2-amino-4,5,6,7-tetrahydro-6-aminobenzothiazole **5a** or an enantiomer or a salt thereof;

wherein -R'- is independently a chemical bond, a  $\text{C}_1\text{-C}_{10}$  alkylene,  $\text{C}_1\text{-C}_{10}$  alkenylene or  $\text{C}_1\text{-C}_{10}$  alkynylene group, and -R'' is independently hydrogen, unsubstituted  $\text{C}_1\text{-C}_6$  alkyl or unsubstituted  $\text{C}_6\text{-C}_{10}$  aryl.

2. (Currently amended) A process as claimed in claim 1, wherein [[P]]the protected cyclohexandione **1p** is a cyclic ketal **1r**;



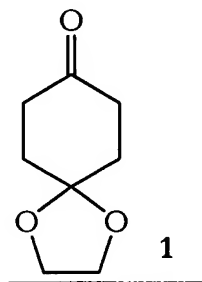
wherein:

X and Y are independently O, S, NR<sup>7</sup> or Se;

n is 2 or 3;

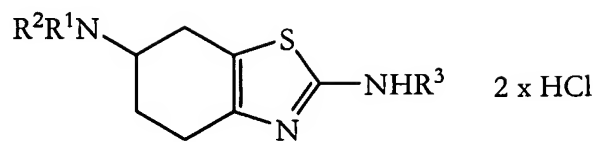
R<sup>5</sup> and R<sup>6</sup> are independently hydrogen, halide, or an optionally substituted alkyl, alkenyl, alkynyl, aryl, arylalkyl, arylalkenyl, arylalkynyl, alkylaryl, alkenylaryl or alkynylaryl group, which may include one or more heteroatoms N, O or S in its carbon skeleton; and  
R<sup>7</sup> is hydrogen or alkyl.

3. (Currently amended) A process as claimed in claim [[2]]1, wherein [[P]]the protected cyclohexandione **1p** is a monoethyleneketal **1**:



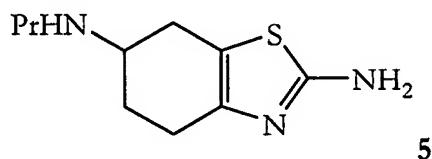
4. (Currently amended) A process as claimed in [[-]]claim 1, wherein R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are independently hydrogen or an optionally substituted ~~alkyl, alkenyl, alkynyl, aryl, arylalkyl, arylalkenyl, arylalkynyl, alkylaryl, alkenylaryl or alkynylaryl group, C<sub>1</sub>-C<sub>12</sub> alkyl, C<sub>2</sub>-C<sub>12</sub> alkenyl, C<sub>2</sub>-C<sub>12</sub> alkynyl, C<sub>4</sub>-C<sub>14</sub> aryl, (C<sub>4</sub>-C<sub>14</sub>)aryl(C<sub>1</sub>-C<sub>12</sub>)alkyl, (C<sub>4</sub>-C<sub>14</sub>)aryl(C<sub>2</sub>-C<sub>12</sub>)alkenyl, (C<sub>4</sub>-C<sub>14</sub>)aryl(C<sub>2</sub>-C<sub>12</sub>)alkynyl, (C<sub>1</sub>-C<sub>12</sub>)alkyl(C<sub>4</sub>-C<sub>14</sub>)aryl, (C<sub>2</sub>-C<sub>12</sub>)alkenyl(C<sub>4</sub>-C<sub>14</sub>)aryl or (C<sub>2</sub>-C<sub>12</sub>)alkynyl(C<sub>4</sub>-C<sub>14</sub>)aryl group~~ which may include one or more heteroatoms N, O or S in its carbon skeleton.

5. (Currently amended) A process as claimed in claim 1, wherein R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are independently hydrogen or an unsubstituted ~~alkyl, aryl~~ C<sub>1</sub>-C<sub>12</sub> alkyl, C<sub>4</sub>-C<sub>14</sub> aryl, or heteroaryl group, ~~which does not include any heteroatoms N, O or S in its carbon skeleton.~~
6. (Currently amended) A process as claimed in claim 1, wherein one of R<sup>1</sup> and R<sup>2</sup> is hydrogen and the other of R<sup>1</sup> and R<sup>2</sup> is an optionally substituted ~~alkyl, alkenyl, alkynyl, aryl, arylalkyl, arylalkenyl, arylalkynyl, alkylaryl, alkenylaryl or alkynylaryl group, C<sub>1</sub>-C<sub>12</sub> alkyl, C<sub>2</sub>-C<sub>12</sub> alkenyl, C<sub>2</sub>-C<sub>12</sub> alkynyl, C<sub>4</sub>-C<sub>14</sub> aryl, (C<sub>4</sub>-C<sub>14</sub>)aryl(C<sub>1</sub>-C<sub>12</sub>)alkyl, (C<sub>4</sub>-C<sub>14</sub>)aryl(C<sub>2</sub>-C<sub>12</sub>)alkenyl, (C<sub>4</sub>-C<sub>14</sub>)aryl(C<sub>2</sub>-C<sub>12</sub>)alkynyl, (C<sub>1</sub>-C<sub>12</sub>)alkyl(C<sub>4</sub>-C<sub>14</sub>)aryl, (C<sub>2</sub>-C<sub>12</sub>)alkenyl(C<sub>4</sub>-C<sub>14</sub>)aryl or (C<sub>2</sub>-C<sub>12</sub>)alkynyl(C<sub>4</sub>-C<sub>14</sub>)aryl group~~ which may include one or more heteroatoms N, O or S in its carbon skeleton.
7. (Original) A process as claimed in claim 6, wherein one of R<sup>1</sup> and R<sup>2</sup> is hydrogen and the other of R<sup>1</sup> and R<sup>2</sup> is *n*-propyl.
8. (Original) A process as claimed in claim 1, wherein R<sup>3</sup> is hydrogen.
9. (Original) A process as claimed in claim 1, wherein the reductive amination of step (a) is carried out with NaCNBH<sub>3</sub>.
- 10-25. (Cancelled)
26. (New) A process as claimed in claim 1, wherein the 2-amino-4,5,6,7-tetrahydro-6-aminobenzothiazole **5a** comprises at least 95% of the (R)- or the (S)-enantiomer.
27. (New) A process as claimed in claim 1, for the preparation of a 2-amino-4,5,6,7-tetrahydro-6-aminobenzothiazole di-hydrochloric acid salt:



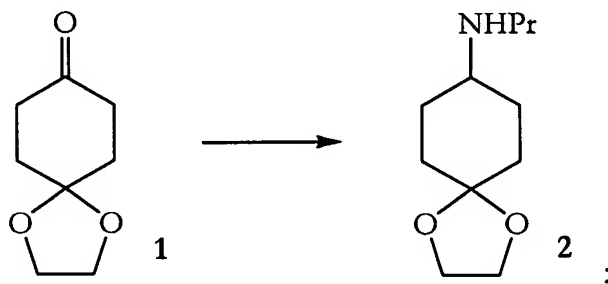
or an enantiomer thereof.

28. (New) A process for the preparation of 2-amino-4,5,6,7-tetrahydro-6-(propylamino)-benzothiazole **5**:

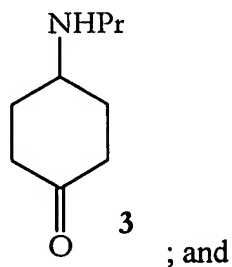


or an enantiomer or a salt thereof, comprising the steps of:

(a) reductively aminating cyclohexandione monoethyleneketal **1** with PrNH<sub>2</sub> to yield 4-*n*-propylamino-cyclohexanone-ethyleneketal **2**:

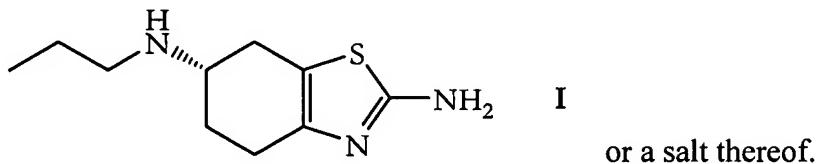


(b) deprotecting 4-*n*-propylamino-cyclohexanone-ethyleneketal **2** to yield 4-*n*-propylamino-cyclohexanone **3**:

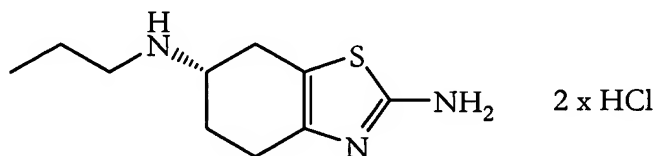


(c) treating 4-*n*-propylamino-cyclohexanone **3** with iodine and thiourea.

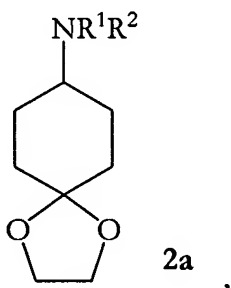
29. (New) A process as claimed in claim 28, for the preparation of (S)-2-amino-4,5,6,7-tetrahydro-6-(propylamino)-benzothiazole **I**:



30. (New) A process as claimed in claim 28, for the preparation of (S)-2-amino-4,5,6,7-tetrahydro-6-(propylamino)-benzothiazole di-hydrochloric acid salt:



31. (New) A 4-amino-cyclohexanone-ethyleneketal **2a**:



wherein one of  $R^1$  and  $R^2$  is hydrogen and the other of  $R^1$  and  $R^2$  is a  $C_1$ - $C_6$  alkyl group.

32. (New) A compound as claimed in claim 31, wherein one of  $R^1$  and  $R^2$  is hydrogen and the other of  $R^1$  and  $R^2$  is *n*-propyl.